

HISPANIC WOMEN'S LEVEL OF SELF-EFFICACY AND IT'S RELATIONSHIP TO
THEIR RISK FOR OSTEOPOROSIS

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ABSTRACT

Albert Bandura's theory of social learning defines self-efficacy as the conviction that one can successfully execute the behavior required to produce a desired outcome.¹ Recent studies have noted self-efficacy as an important factor in an adult's determination to change health behaviors. In fact, self-efficacy has been incorporated in the Health Belief Model (HBM) as an additional influence on the modifying factors of health behavior and one's likelihood of action towards change.²

One particular health outcome of concern regarding self-efficacy is osteoporosis, which is a disease characterized by an inadequate amount and or faulty structure of bone.³ This disease varies greatly across ethnic groups. Hispanic women as a group have a 14% prevalence of osteoporosis in the femoral neck as opposed to 6% in African-American women.⁴ While Hispanic women's threat of this disease has been noted in a number of studies, efforts to document their self-efficacy regarding osteoporosis is not well researched.

The purpose of this study was to distinguish the relationship between levels of self-efficacy and several important risk factors for osteoporosis in a small group of middle-aged, uninsured Hispanic women. The population included in the study was a convenient sample (n=50) of women who attended a free health clinic. Upon consent, participants were asked to complete the Osteoporosis Self-Efficacy Scale (OSES), a 21 item questionnaire that assesses levels of self-conviction to change diet and exercise, which could lower their risk for osteoporosis.⁵

All OSES subscales were scored using a scale of 0-100, with 0 representing a minimal conviction and 100 representing a maximum value of self-efficacy relating to

diet or exercise improvement. The participants demonstrated a mean value of 65.3 (SD 22.1) representing a strong conviction to improve exercise and a mean value of 72.8 representing a strong conviction to improve dietary calcium intake. These values indicate a confident attitude among the majority of the respondents to change their diet and exercise habits thereby lowering their risk of osteoporosis.

The motivation demonstrated by these Hispanic women is an encouraging sign, as they show high levels of self-efficacy despite their economic challenges. Continued research among underserved groups of women at risk for osteoporosis will promote the development of educational interventions that will be culturally sensitive and build on their conviction for health behavior change.

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PROBLEM STATEMENT

Albert Bandura's theory of social learning helps to inform the level of contribution that an adult's determination makes in changing their health behavior as well as their final health outcome.^{1, 2, 3} The term self-efficacy has been used to codify this personal determination for change. Bandura defined self-efficacy as the conviction that one can successfully execute the behavior required to produce a desired outcome.¹ Health behavior change is an area of research that has been greatly enhanced by the addition of measuring self-efficacy. Many studies have been done to document the importance of self-efficacy in accounting for initiating and maintaining health behavior change. In fact, self-efficacy is so important to health behavior change that it has been incorporated in the Health Belief Model (HBM) as an additional factor. Self efficacy, or one's confidence in their ability to take action, has been placed in the model under the heading "likelihood of action."⁴ (See Figure 1).

A particular health outcome of concern is osteoporosis, which is a disease characterized by an inadequate amount and or faulty structure of bone.⁵ Often this can result in fractures from slight trauma. While this disease varies greatly across ethnic populations, there is currently no gene, gene product, or gene polymorphism that has been reproducibly shown to account for the differences in bone mineral density (BMD) among racial groups.⁶ Hispanic women are one particular group who have been difficult to describe, relative to the incidence of osteoporosis. An example of this dilemma is the 6% prevalence of osteoporosis at the femoral neck among post menopausal African-American women in the USA while the prevalence among Hispanic women is 14%.⁷ The

threat of this disease among Hispanic women has been conducted in a number of studies, but efforts to document health behavioral change among these women has been scant.

To devise a strategy for improving osteoporosis as a health outcome, the Health Belief Model (HBM) has been used as a theoretical framework. The HBM can act as a structure for collecting descriptive information on the level of self efficacy that Hispanic women might possess relative to their risk for developing osteoporosis. Previous research has already established a link between self-efficacy and a possible reduction in the risk of osteoporosis among a Canadian group of participants⁸. This work needs to be replicated with Hispanic women while being mindful of any cultural characteristics that might impact their threat of osteoporosis. These kinds of studies have national as well as international implications for preventing osteoporosis among Hispanic women.

RELATED RESEARCH

Osteoporosis is a disease that is characterized by low bone mass, causing bone fragility and increased risk of bone fractures, especially at the hip, spine, and wrist. Although risk of the disease increases with increasing age, building high bone mass at a young age by practicing lifestyle habits such as adequate calcium and vitamin D intake and regular exercise is the best way to prevent osteoporosis later in life. Additional factors including being female, postmenopausal, and belonging to Caucasian, Asian or Hispanic ethnicities also put one at greater risk for developing osteoporosis.⁹ It is important to promote osteoporosis prevention in groups such as Hispanic women who are at a greater risk for the disease. Factors of health behavior such as self-efficacy levels specific to Hispanic women may be influential in determining their risk and strategizing means for prevention of osteoporosis.

Previous research in the areas of osteoporosis risk and levels of self-efficacy among Hispanic women is varied but common themes can be used to inform research that is conducted in this area. As noted in the Health Belief Model (See Figure 1), self-efficacy directly relates an individual's modifying factors of health behavior, such as education, race, and socioeconomic status. This also includes the influence of self-efficacy on an individual's likeliness to take action and change their health behavior.

Self Efficacy and Modifying Factors

In a recent study of cultural and socioeconomic differences in calcium intake, a study of 66 women (matched 33 Caucasian and 33 African-American) demonstrated a similar level of calcium intake.¹⁰ The differences noted in this study were intakes of dairy foods and grain products among older black and white women. This study points to

important cultural differences that could affect a health promotion and data collection regarding the prevention of osteoporosis.

Building on ethnic differences related to the risk of osteoporosis, another study using secondary data analysis of the National Health and Nutrition Examination Survey (NHANES) data set described the incidence of osteoporosis among Hispanic women and related it to acculturation, environmental factors, intrapersonal, and physical environment. Although the data collected on Hispanic women was a lower percentage than other racial groups, it qualified as a larger population due to the size of the NHANES collection strategy.¹¹ Taking the incidence of osteoporosis that was attributed to many different ecological spheres of influence and replicating this study through actual responses provided by Hispanic women would be an important next step.

A general lack of knowledge may exist among women of all races with regard to prevalence of osteoporosis. Some of the more common facts that should be stressed are that by age 20, the average woman has acquired 98% of her skeletal mass. It is also a fact that building strong bones during childhood and adolescence can be the best defense against developing osteoporosis later in life.⁹ This lack of information and the actual risk for osteoporosis was explored in a descriptive research study staged with Hispanic women in the southwest. The survey included 43 Hispanic women who were in the age range of 25-55 years. A random digit dialing survey was conducted to look at their levels of calcium consumption.¹² The results of this small study recorded an understanding by the participants of the link between body weight and the risk of osteoporosis. However there was confusion among participants about the role that calcium consumption and exercise played in bone health. Although the study was small, it pointed out some

potential misunderstandings about the important role that calcium consumption and exercise play in the prevention of osteoporosis among older Hispanic women.

An additional study was conducted with a group of women to record their self reported levels of calcium intake and exercise. This cross sectional survey of 321 women whose mean age was 21.6 years found that 86% of the women had never heard of osteoporosis. The respondents went on to report that only 3.8% reported obtained adequate exercise and 1,200 mg of calcium per day.¹² Respondents doubted they would ever develop such a condition ($p < .0001$). One of the limitations of this research was that the subject composition was 63.5% white and 29.2% black and they were enrolled in an undergraduate course for health. This study, although interesting, doesn't reflect the kind of actual knowledge that Hispanic women might have about the prevention of osteoporosis.

Self Efficacy and Likelihood of Action

A related cohort study was attempted to capture a better understanding of a group of Hispanic women's sexual practices and the outcome of preventing HIV/AIDS. A convenient sample of women were surveyed about their health behaviors during their visit to a public health clinic. The Sexual Self-Efficacy scale was used to record the women's ability to assert themselves in regards to sexual practices. Out of 125 participants, only 52 indicated being of Hispanic decent, which was a small subset of the overall group.¹³ The overall study results demonstrated that traditional roles and gender were stronger factors than self-efficacy in determining safe sex practices in this sample. Since the number of Hispanic women was so small, the results are only reflective of those

Hispanic women who participated. In addition, the ages of the participants ranged from 17-54, so it is possible that the results could be affected by generational differences. In this particular study, the women surveyed were unaffected by self-efficacy as it related to sexual practices.

An additional cohort study was reviewed that did capture the effect of self-efficacy. Survey research with Hispanic college students attempted to determine the influence of self-efficacy and social support on lowering personal stress. Out of 164 Hispanic participants, two groups were formed with 121 women and 43 men to provide responses. The demographic information provided indicated that 70% of the students were of Mexican heritage. Once the survey data was analyzed, 27% of participant provided responses that indicated that stress was controlled by their self-efficacy.¹⁴ This survey research is important as it provides data that is focused specifically on self-efficacy among Hispanics. One flaw in this study is that the results are not specifically directed at female self-efficacy.

The highest level of evidence was a study designed to record Hispanic women's level of self-efficacy and how it mediated their health behaviors. A wellness guide was provided for two different groups of Hispanic women as an intervention. Interestingly, those women who were highly acculturated provided more responses that indicated their health behaviors were directly influenced by self-efficacy.¹⁵ Those with low acculturation were less prone to be influenced by self-efficacy. The issue of acculturation appears to be an important mediating factor for self-efficacy and could be important in a study of health behavior change.

In planning a health promotion activity targeted at osteoporosis prevention among Hispanic women, it would be important to not only notice the ethnic differences attributed to self-efficacy but also those that could influence diet and exercise.

Although isolated studies have been conducted on self-efficacy and the risk of osteoporosis among groups of Hispanic women, little work has been done to explore how these factors influence each other. The Health Belief Model could be used as a theoretical framework to collect descriptive information on the level of self efficacy that Hispanic women possess relative to their risk for developing osteoporosis.

OBJECTIVES

The purpose of this study was to measure the levels of self efficacy regarding several important osteoporosis risk factors in a small group of Hispanic women. Self-efficacy was identified as a significant variable in the Health Belief Model to explain the change in health behaviors. Analysis of this variable could show the levels of conviction that Hispanic women had to change their behaviors and thereby reduce their risk of osteoporosis. Because osteoporosis is a disease that varies greatly across populations, it is important to provide ethnic groups with information about osteoporosis that is culturally sensitive. It is hoped that the relationship identified between self-efficacy and osteoporosis prevention could be used to develop culturally sensitive educational materials that would help to reduce the risk of osteoporosis among Hispanic women. Therefore, the proposed research question is: What is the relationship between levels of self-efficacy and several important osteoporosis risk factors among Hispanic women who are likely at risk for osteoporosis?

PROCEDURES

The population included in the study was a convenience sample of Hispanic women who attended The Ohio State University's la Clinica Latina. The clinic provides free medical services to men and women of Hispanic descent two times per month. Since the IRB approval required de-identified participants, the surveys used in the study only included a cover sheet to provide the woman's country of origin and date of birth. This cover sheet allowed the data to be further explored using the demographics of countries of origin.

All women who are in the waiting room of the clinic were approached and asked if they would like to fill out a series of surveys about their health beliefs and knowledge of factors relating to osteoporosis. Upon consent, they were provided a set of surveys to complete while they waited for a medical exam by the volunteer medical staff. They were allotted as much time as needed to complete the surveys, and returned them to the researcher upon completion. After the researcher verified that the surveys were complete, the subjects were given a \$1.00 coupon for a dairy treat at McDonald's Restaurants. The sample size for the study was $n=54$. Obtaining the sample size required several data collection sessions at la Clinica Latina. The number of patients that visited the clinic varied from session to session, and five to ten sets of surveys were completed during each data collection period.

This research was done in conjunction with Dr. Kevin Evans who provided a battery of surveys for this group of Hispanic women at La Clinica Latina. Dr. Evans obtained OSU IRB approval for the project: 2006E0658 approved on 9/29/06. Exempt review.

During data collection, researchers were seated near the registration desk and asked each woman to consent to the study and complete a survey. The surveys were numbered and the researcher tracked them by recording participant numbers throughout the study. The researchers remained in the lobby area for the entirety of the clinic administering and collecting surveys. Once the clinic concluded, the researcher recorded which numbers of surveys were collected and the number of surveys that were completed. Data collection began on Tuesday, October 17th, 2006 and continued through the first and third Tuesday of the following months.

The Osteoporosis Self-Efficacy Scale (OSES) was a survey used to measure of self-efficacy. This is a 21 item survey which contained two subscales; one (items 1-10) measured exercise variables and the other (items 11-21) measured calcium variables. The psychometric analysis of the OSES is based on data from a project done in 1990-1991 at Grand Valley State University with 201 women, 35 years or older. Reliability coefficients for internal consistency (Cronbach alpha) of each subscale was .94 and .93, respectively. Validity of the OSES was evaluated by factor analysis and hierarchical regression analysis (See attached).

The project required a translation of the Osteoporosis Self-Efficacy Scale into Spanish. The survey included instructions for answering the questions pertaining to self efficacy in osteoporosis, asking subjects to rate how sure they would be about doing specific health activities that promote osteoporosis. For each question, a rating scale with ordinal measurements was provided for the subject to express their ability to participate in the specific osteoporosis prevention activities.

Upon completion of data collection, the surveys were compiled into a database and the self-efficacy ratings and were analyzed according to each item included on the survey. Means, medians, and modes will be provided so that descriptive statistics can be used to demonstrate the level of self-efficacy that these Hispanic women provided.

FACILITIES AND RESOURCES

The facility used for data collection was la Clinica Latina. This clinic is an outreach service that is offered on the first and third Tuesday of every month. It is hosted within Rardin Family Practice Clinic on North High Street. The faculty allows a volunteer medical staff to use their offices starting at 5:00 p.m. on these dates. The staff provides care to Hispanic men and women for various health issues on a first come, first served basis and continues to work throughout the night until every patient has been examined.

Other resources used for this project included equipment for the copying of surveys, translation of the Osteoporosis self-efficacy scale into Spanish by a fluent Spanish speaker, back translation of the survey into English (IRB requirement), and a database for scoring and analysis of the survey instrument.

RESULTS

Responses for the Osteoporosis Self-Efficacy Scale (OSES) were recorded for each participant and analyzed for descriptive statistics. All subscales were scored using a scale of 0-100, with 0 representing no self-efficacy relating to diet or exercise improvement and 100 representing complete self-efficacy relating to diet or exercise improvement. The participants provided a median score of 65.3 on the OSES subscale for the conviction to perform exercise. Figure 2 provides the distribution of scores for self-efficacy relating to exercise. The next subscale dealt with the conviction to increase dietary calcium and the median score for the respondents was 80. Figure 3 provides the distribution of responses for self efficacy relating to calcium consumption. The mean value for the participants' conviction in their ability to improve exercise was 65.3 (SD 22.1). Finally, the mean value of the calcium subscale for the respondents was 72.8 (SD 22.6). See Table 1.

Table 1. OSES Subscale Means

| | N | Scale Range | Score Range | Mean Score | SD |
|-------------------------------|----|-------------|-------------|------------|-------|
| OSES Exercise subscale | 54 | 0-100 | 0-100 | 65.26 | 22.14 |
| OSES Calcium subscale | 54 | 0-100 | 0-100 | 72.76 | 22.61 |

Figure 2. Participants' Measure of Self Efficacy Related to Exercise

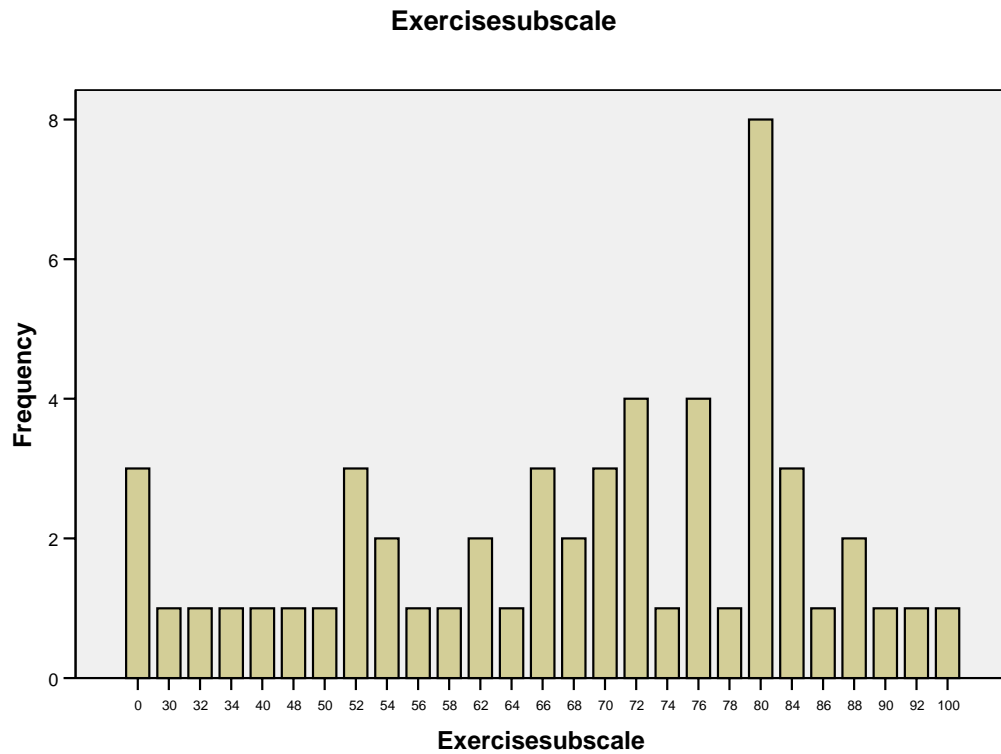
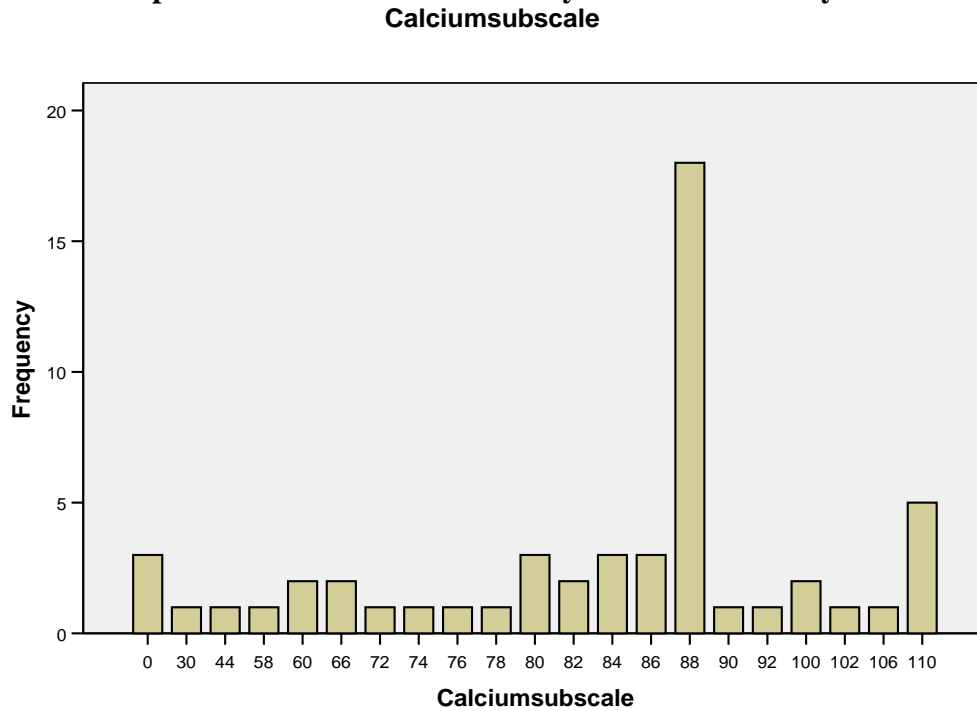


Figure 3. Participants' Measure of Self Efficacy Related to Dietary Calcium



A comparison was also made to determine the inter-correlation of the OSES exercise and calcium subscales. A Pearson correlation coefficient was calculated in an effort to demonstrate the relationship of the subscales within the individual surveys. This comparison was highly positively correlated a value of $R=0.81$ and a statistical significance of $p=0.00$.

Table 2. Inter-correlations between OSES subscales

| | OSES_Exercise | OSES_Calcium |
|----------------------|----------------------|---------------------|
| OSES_Exercise | | 0.81 |
| OSES_Calcium | 0.81 | |

The participant's data set was also used to determine the reliability of the survey instrument. The OSES subscales had a range of reliability from 0.93 to 0.97.

Table 3. Cronbach's alpha calculated with Hispanic participants

| Survey Scale | Number of Items | Cronbach's alpha calculated | Published reliability |
|----------------------|-----------------|-----------------------------|-----------------------|
| OSES Exercise | 10 | 0.926 | Cronbach's 0.90 |
| OSES Calcium | 11 | 0.966 | Cronbach's 0.90 |

DISCUSSION

The present study was a feasibility study involving uninsured Hispanic women receiving medical services from la Clinica Latina in Columbus, Ohio. The clinic is held on the first and third Tuesday of every month and advertises through newsletters for the Latin community in central Ohio. The volunteer medical staff serves the men and women who come to the clinic on a first come, first served basis and continues until the last patient has been seen. The women participating in the OSES survey were approached as they waited for services in the Clinic's lobby. Upon consent, they were given a set of three surveys including the OSES survey which asked them to complete all questions.

Most of the participants involved in this study were of Mexican origin and had very limited literary skills. Almost all of them were accompanied by their husband and often had children and extended family members with them as well. A subgroup of the participants was of Mayan descent, most of who obtained little education in their childhood and were virtually illiterate. These women often needed assistance either from their male companions or medical staff with understanding the meaning of the questions and properly marking their answers on the numbered scales. While American students are exposed to standardized testing from a very young age, this group of women was completely unfamiliar with the type of scaled questions that the OSES instrument contained.

The Osteoporosis Self Efficacy Scale provided a theoretic approach to quantitatively measure the convictions of a group of Hispanic women to practice osteoporosis prevention as part of their health behaviors. Results demonstrated a high level of reliability and a strong correlation between the two OSES subscales. The

participants provided a median score on the OSES subscale for the conviction to perform exercise with a median score of 65.3 (scale 0-100). The next subscale dealt with the conviction to increase dietary calcium and the median score for the respondents was 80 (scale of 0-100). The mean value for the participants conviction in their ability to improve exercise was 65.3 (SD 22.1) and the mean value for the calcium subscale was 72.8 (SD 22.6).

These values indicate a confident attitude among the majority of the respondents with regard to improving their exercise habits and a strong conviction that they could increase their calcium intake with changes in diet. The motivation demonstrated by these women is an encouraging sign, as they show high levels of self-efficacy despite their economic and literary challenges. This indicates that many of the participants are convicted to increase calcium and exercise points to a strong opportunity for health educators to appeal to this group of women. Adopting health behavior change happens more frequently when participants indicate an eagerness and willingness to make the suggested changes.

A comparison was made between previously published studies that utilized the OSES surveys to determine how this small group ranked among others. The current study did demonstrate a low level of knowledge in comparison to Caucasian and Persian participants and a slightly higher level the Chinese participants for the Osteoporosis Knowledge Test. However, this group did demonstrate higher levels of self-efficacy regarding calcium intake and exercise than both the Persian women and Chinese students who took the OSES surveys. See Table 4.^{16, 17}

Table 4. Comparison of Survey Means Across Relevant Published Research

| Study Mean Comparisons | Hispanic Women N=54 | Persian Women N=120 | Chinese Students N=23 | Chinese Men N=52 | Kim, Horan, and Gendler Men and Women |
|-------------------------------|---------------------|---------------------|-----------------------|------------------|---------------------------------------|
| OSES Exercise subscale | 65.26 | 61 | 30.7 | N/A | |
| OSES Calcium subscale | 72.76 | 42 | 31.1 | N/A | |

This group of uninsured Hispanic women reported a low level of knowledge about osteoporosis and an even lower level of knowledge concerning the impact of exercise and calcium on the disease. Therefore, these women represent an opposite challenge in comparison with these previously studied ethnic groups, as they are motivated and have strong convictions but lack knowledge concerning this disease. Their lack of education and economic funds has most likely made it difficult for them to receive proper medical attention, but it has not taken away their confidence to make healthy lifestyle improvements.

The attitudes expressed by this group of women demonstrate the need for culturally sensitive information for Osteoporosis prevention. Using educational tools will increase the knowledge about Osteoporosis and its risk factors. A demonstrational video shown in offices such as la Clinica Latina that is spoken in Spanish and uses clear, simple words to teach women about the disease could be an effective tool. Since most of these women are employed in jobs without health insurance, it is critical to develop educational interventions that are low cost and are easily accessible. In conjunction with the belief in

their ability to change their eating and exercise habits, this will promote a healthier lifestyle that may lead to Osteoporosis prevention.

This study was difficult to conduct due to the low literacy level of many patients that attended the Clinica Latina. Upon completion of a survey, the instrument was handed back to the researchers and reviewed for accuracy and completeness. Participants were often directed to complete portions of the survey instruments that were left blank. At this point, the survey was then read orally by a member of the Clinic's volunteer medical staff. In order to eliminate data bias, distribution of the surveys were terminated at a sample size of $n=54$ because the researchers felt it would be best to only analyze surveys that were complete.

The entire OSES survey was translated into Spanish and then back translated into English by two separate fluent speakers to ensure no content was lost. However, there was still a large amount of misunderstanding about the level of literacy in this impoverished group of participants. Nonetheless, measures had to be taken to allow participants to complete all of the questions in the survey so results could be properly analyzed. Unfortunately, it would have been impossible to obtain the responses on the surveys without assistance being provided. The difficulty displayed by the participants in completing the survey instruments was not anticipated although it was handled by the volunteer staff.

The research design chosen makes this study only descriptive of this group of women as a convenient sample. As these members of the Hispanic population in Columbus are without health insurance and usually lacking in education and economic funds, it is likely that they move and switch jobs often. In addition, the free services at the

clinic are anonymous and no form of identification is required of the patients. It would have been nearly impossible to follow this sample over a period of time or complete follow-up studies. The women who attended la Clinica Latina are a very transient group therefore using the OSES survey instrument within a convenient sample was the most controlled way to gather data from this subgroup of the Hispanic community.

Although this feasibility study has methodological design flaws, it does provide descriptive information on this group of uninsured Hispanic women and compares their results to previous studies. The hope of providing this research is to spur continued research among underserved groups of women and also to begin to develop educational interventions which address their unique misunderstandings. It also provides more detail by obtaining data with subscales of inquiry which, many studies haven't provides.

This study targeted a group of women with limited economic and medical resources and demonstrated their distinct characteristics regarding self-efficacy in osteoporosis behaviors. This information can be used to inform medical professionals about the misconceptions regarding Hispanic women and their risk for osteoporosis. This type of research has the translational quality of addressing unique needs among racial and ethnic groups at risk for chronic diseases such as osteoporosis.

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Figure 1. Health Belief Model for Health Behavior Change to include Self-Efficacy

